



Subject card

Subject name and code	, PG_00056108						
Field of study	Mechatronics						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2024/2025		
Education level	first-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	3	Language of instruction			Polish		
Semester of study	5	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Grzegorz Ronowski				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	30		0.0		0.0	30
Subject objectives	The aim of the course is to acquire knowledge of the construction of motor vehicles by students.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W11] has a basic knowledge about the life cycle of mechatronic systems and objects	The student describes the periods of the life cycle of vehicles: design, production and operation (use and maintenance, recycling, utilization).			[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
	[K6_U05] is able to use properly chosen tools to compare design solutions of elements and mechatronics systems according to given application and economic criteria (e.g. power demand, speed, costs)	The student describes the general structure of the car. It shows the characteristics of the engine in connection with the necessary drive mechanisms. Lists the types of drive systems. Describes the construction of: clutches, gearboxes, drive shafts. It presents differentials, driveshafts and wheel bearings.			[SU5] Assessment of ability to present the results of task		
	[K6_W10] has a basic knowledge about development trends in terms of engineering and technical sciences and scientific disciplines: Mechanical Engineering, Automation, Electronics and Electrical Engineering, adequate for Mechatronics course	The student explains the construction of steering systems. Presents braking systems. Describes the structure and kinematics of suspensions. It presents car shock absorbers, their types and development trends in their design.			[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
Subject contents	LECTURE The general structure of a car. Characteristics of the engine and the necessary drive mechanisms. Drive systems. Design of clutches, gearboxes, drive shafts and joints, driving axles. Differentials, driveshafts and wheel bearings. Construction of steering systems. Braking systems. Design and kinematics of vehicle suspensions. Car shock absorbers, types, design solutions.						
Prerequisites and co-requisites	Knowledge of the basics of machine construction and construction recording.						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Tests during the semester		55.0%		100.0%		

Recommended reading	Basic literature	<p>1. Studziński K.: Samochód teoria, konstrukcja i obliczanie. Wyd. Naukowo-Techniczne, Warszawa, 1980.</p> <p>2. Jaśkiewicz Z.: Projektowanie układów napędowych pojazdów samochodowych. WKŁ, Warszawa, 1982.</p> <p>3. Reimpel J.: Budowa samochodów Podstawy Konstrukcji, WKŁ, Warszawa, 1997.</p> <p>4. Zając M.: Układy przeniesienia napędu samochodów ciężarowych i autobusów. WKŁ, Warszawa, 2003.</p> <p>5. Prochowski L.: Pojazdy Samochodowe Mechanika ruchu, WKŁ. Warszawa. 2005.</p> <p>6. Zieliński A.: Konstrukcja nadwozi samochodów osobowych i pochodnych, WKŁ. Warszawa. 2003.</p>
	Supplementary literature	No requirements.
	eResources addresses	
Example issues/ example questions/ tasks being completed	Replace friction clutch components. Selection of dimensions of the friction lining of the clutch plate of the car. Synchronization conditions for a system of three shafts with two cardan joints.	
Work placement	Not applicable	